

ON CERTAIN MEXICAN METEORITES.

BY MARIANO BARCENA.

At the last meeting of the Academy, Prof. Smith having spoken of an aerolite from Chihuahua, I have thought proper to relate some facts about other Mexican meteorites.

Certainly, my country is most abundantly provided with these meteoric masses; to the present time they have been found in the States of Chihuahua, Sonora, Sinaloa, Nuevo-Leon, Coahuila, Zacatecas, Durango, San Luis Potosi, Mexico, and Oaxaca.

The most notable masses which have been discovered in Chihuahua are found in the "Concepcion hacienda," and in a place called "Chupaderos." I have seen two pictures of one of the meteorites of the former place, and, according to the explicatory scale which the drawing had, I could judge that it was of great dimensions; its form, like that of all the meteorites of Mexico, tends to that of a prism of curved faces, and presenting various irregularities. They have assured me that the mass which is found in Chupaderos is of greater dimensions than the one I have mentioned.

Other meteoric irons of various dimensions are found in the vicinity of the "Presidio del Principe," in the same State of Chihuahua. The National Museum of Mexico possesses various facts about these masses, and probably will get some of the latter, as the inhabitants of that State have promised to send some of them.

The Mexican Society of Natural History of the City of Mexico received last year a picture and some small fragments of an enormous meteoric mass lately discovered in the State of Sinaloa. Although I do not remember at present its exact dimensions, still I can assure the Academy that its length was more than twelve feet. I have commenced to analyze that meteorite, and I will conclude the work on my return to Mexico. Like those to which I have referred, it belongs to the class of the *SIDERITES* of Mr. Daubrée—as it is composed essentially of iron and nickel. It is of a silver-white and grayish color.

The aerolites of Nuevo-Leon and Coahuila were found in

“Santa Rosa” and in the “Potosi.” The facts we have regarding them are few and insignificant.

From Zacatecas they have taken to Europe various samples of meteoric irons; one of them was analyzed by Clark, and had the following composition:—

Iron	86.09
Nickel	9.96
Chromium	0.67
Sulphur	0.84
Magnesia	0.19
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	97.75

Baron Humboldt and other persons have also carried to Europe some samples of meteorites from Durango. The analysis made by Mr. Damour of the aerolite of the Mezquital is known; the composition is the following:—

Iron	93.38
Nickel	5.89
Cobalt	0.39
Phosphorus	0.23
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	99.89

In the National Museum of the City of Mexico exists another meteoric mass, which came from the “Cascaria” hacienda in the State of Durango. It is composed in great part of iron, and, on attacking its surface with acid, the figures of Widmastaeten appear very clearly—the dominant form of these figures being quadrilateral.

In the State of San Luis Potosi two aerolites of large dimensions were found. One of them, called “Meteorito de la Descubridora,” was sent four years ago to the Mexican Society of Geography and Statistics of the City of Mexico, by Messrs. Cabrera and Yrizar of the City of San Luis Potosi. This mass, which weighed 576 kilogrammes, was divided in several pieces for the purpose of making some investigations as to its structure. The form of the meteorite was also prismatic; it resembled that of a pyramid with a triangular base; the drawing taken with a photographic apparatus presented in its outline several lines well determined, which formed triangular and quadrilateral figures very similar to those produced by hydrochloric acid upon the polished surface of the same mass. The color of the aerolite is

grayish-white, and its texture is notably crystalline. Its specific weight is 7.38. It is composed of

Iron	89.51
Nickel	8.05
Cobalt	1.94
Sulphur	0.45
Chromium	trace
Loss	0.05
	100.00

The resistance of that iron to rupture by compression is 38 kilogrammes to the square millimetre; the resistance to the rupture by extension is 40 kilogrammes, being the section of the metallic thread of a square millimetre. The coefficient of lineal dilatation between 0° and 100° is 0.0000701.

The analysis of the meteorite in question was made by the Mexican chemist, Don Patricio Murphy; the other studies were made by a commission, of which I had the honor of being a member.

My learned friend, Prof. James D. Dana, of New Haven, possesses a fragment of this meteorite, which I sent to him, and in which the figures of Widmasstaeten are perfectly formed. The meteoric iron of the "Descubridora" is also very notable for the many cavities which it has in its interior, and which are occupied by the troilite or proto-sulphide of iron. It presents itself under the form of a crystalline powder of a bronze-yellowish color.

Another meteorite from the State of Zacatecas, which was found in the vicinity of "Charcas" was taken to the Museum of Paris by the French army. Its form is like that of a triangular pyramid. Its analysis was made by Prof. Mennier, and is as follows:—

Iron	93.01
Nickel	4.32
Insoluble matter in acids	0.70
	98.03

In the State of Mexico have been found several meteorites called "Ocotitlan," "Tolnea," "Yxtlahuaca," and "Xiquipileo." The first three were taken to Europe: the "Ocotitlan" was studied by Profs. Burkart and Bergeman, who, on analysis, found the following composition:—

Iron	85.49
Nickel	8.17
Cobalt	0.56
Insoluble matter in acids comprising Schreibersite, Graphite, etc.	5.00
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	99.12

In Xiquipilco the meteoric irons are very abundant, and all proceed probably from a great mass which was broken into pieces. A sample from that locality analyzed by Mr. Pugh had the following composition:—

Iron	90.43
Nickel	7.62
Cobalt	0.72
Phosphorus	0.15
Sulphur	0.03
Copper and tin	0.03
Schreibersite	0.56
Graphite	0.34
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	99.88

The specimens of a meteoric iron from Xiquipilco are very remarkable for their crystalline structure. Schreibersite is found under the form of white and flexible laminae determining octahedral cleavages. In the same collection which the Mexican Society of Natural History of the City of Mexico sent to the International Exposition, is found a sample of iron from Xiquipilco, in which I discovered a part of a regular octahedron, raising the laminae of the Schreibersite, which are located in perfect regularity on the specimen.

The National Museum of the City of Mexico sent also to the Exhibition a sample of meteoric iron from the same locality; in it is observed an oxidized layer which presents several green spots produced by the compounds of nickel which it contains. That layer to which I refer is characteristic of the iron from Xiquipilco.

In the State of Oaxaca have been found two very remarkable meteoric masses, which are distinguished by the names of "Mixteca Iron" and "Yanhuitlan Iron."

The first was studied by Profs. Burkart and Bergeman; its composition is the following:—

Iron	86.857		
Nickel	9.917		
Cobalt	0.745		
Phosphorus	0.070		
Sulphur	0.553	0.524 carbon and iron.	0.053 phosphorus.
Insoluble residue in the acids	0.975		
	<hr/> 99.117		0.265 iron.

The meteorite "Yanhuitlan" is found at present in the National Museum of the City of Mexico. It was found in the vicinity of Yanhuitlan, by some countrymen when they were tilling the soil, at the foot of a hill called Deque-Yucumino. Its weight is 916 pounds.

The figure of this mass is very interesting, as it approaches remarkably to that of a tetrahedron. Its color is grayish-white. Its specific weight is 7.824, and its composition, discovered by the celebrated Mexican chemist, Don Leopoldo Rio de la Loza, is the following:—

Iron	96.58182
Nickel	1.83200
Volatile substances	0.36210
Silicious sands	0.00560
Carbon	0.00018
Lime	0.60815
Alumina	0.61045
	<hr/> 100.000

There are other facts about several meteorites from Mexico, but the places where the latter are found are not well determined.

That peculiar property, difficult of explanation, which the Mexican soil has in attracting the meteoric irons, is even noticed at present; numerous are the shooting stars which cross the atmosphere of that republic, and more especially in the months of August and November. This phenomenon, which is also observed in other parts of the world, I have seen on various occasions in my country. Lately one of those shooting stars came against a summer-house in the State of Puebla, causing much damage to the occupants.

The studies which may be made beforehand of the physical characters and the chemical composition of the meteorites of Mexico, will group the latter in series, and will refer many of them, perhaps, to the same origin, as it is the case with the "Xiquipileo" meteorite, which, by its crystalline structure and other properties, may be thought to proceed from the same mass.